CLAIMS

I claim:

1. A method for disrupting target cell expression at the mRNA level in a mammalian cell, wherein the method comprises using RNA interference (RNAi) to achieve post-transcriptional gene silencing.

2. The method of claim 1, wherein the mammalian cell is from a cell line.

3. The method of claim 1, wherein the mammalian cell is a human cell.

4. The method of claim 1, wherein the method further comprises initiating RNAi in the cell by exposing the cell to a gene-specific double stranded RNA (dsRNA), wherein the dsRNA is specific for the target gene encoding the disrupted expression.

5. The method of claim 4, wherein the method further comprises blocking mammalian gene function of the target gene encoding the disrupted expression.

6. The method of claim 5, wherein the method further comprises screening dsRNAs to identify the dsRNA that disrupts target cell expression at the mRNA level.

7. The method of claim 1, wherein the target cell is a tumor cell.

8. The method of claim 7, wherein the target cell is malignant.

9. The method of claim 6, wherein the method further comprises producing RNA-based drugs to disrupt target cell expression at the mRNA level.

10. The method of claim 5, wherein the method further comprises producing a 'knock-out' model animal in which target cell expression is disrupted at the mRNA level.

11. The method of claim 6, wherein the RNA-based drugs that disrupt target cell expression at the mRNA level, treat human disease.

12. A method for detecting the presence of a target nucleic acid sequence in a biological sample, comprising the steps of:

transcribing the target sequence into dsRNA,

exposing the biological sample to the dsRNA, and

detecting inhibition of gene function of the target nucleic acid sequence in the biological sample, wherein if inhibited, the target nucleic acid sequence is present in the sample.

13. The method of claim 12, wherein at least two different target sequences are transcribed into dsRNAs and the corresponding inhibited gene expressions are detected simultaneously in the same sample.

14. A method for treating a mammalian subject with an RNA-based disorder or disease by administering to the subject a dsRNA preparation for initiating disruption of target cell expression at the mRNA level, wherein the method comprises using RNAi to achieve post-transcriptional gene silencing.

15. The method of claim 14, wherein the mammalian subject is a human patient.

16. The method of claim 14, wherein the method further comprises initiating RNAi, wherein the dsRNA is specific for a target gene encoding the disrupted expression.

17. The method of claim 16, wherein the method further comprises blocking mammalian gene function of the target gene encoding the disrupted expression.

18. The method of claim 17, wherein the target cell is a tumor cell.

19. The method of claim 18, wherein the target cell is malignant.

20. The method of claim 17, wherein the method further comprises producing RNA-based drugs to disrupt target cell expression at the mRNA level.